impac®

certified ISO 9001:2000 IMPAC Infrared

IS 140 · IGA 140

Highly accurate, fully digital, fast

Pyrometer with focussable optics for non-contact temperature measurements on metals, ceramics, graphite etc. between 300 und 3300°C

- ◆ Temperature ranges between 300 and 3300°C

- ◆ Short response times < 1 ms
  optional 500 µs

- ◆ Extremly small spot sizes, min 0.35 mm

- ◆ Built in digital display with temperature indication

- ◆ Optimized thru-lens view finder
  or laser targeting light

- ◆ Test current output

- ◆ Housing with precision mounting rail for
  safe mounting and accurate alignement

- ◆ Interface RS232 / RS485 switchable

- ◆ Focusable optics

The pyrometers **IS 140** and **IGA 140** are digitial, highly accurate pyometers for non-contact temperature measurement on metals, ceramics, graphite etc.
For optimal match of the intrument to the application 3 different focussable optics with extremly small spot sizes are available.
The pyrometer parameters can be selected via the integrated key pad, the settings are indicated on the built-in LC-Display. In measuring mode the actual temperature is indicated.

The pyrometers are equipped with RS232 and RS485 serial interfaces (switchable inside the pyrometer). This enables additionally the reading of temperature and pyrometer parameters via the provided *InfraWin* PC-software. If necessary the parameters also can be changed via PC.
A laser targeting light or thru-lens view finder for exact alignment of the pyrometer is available.

Typical applications:

- preheating
- annealing
- tempering
- welding
- forging
- hardening
- sintering
- melting
- soldering
- rolling
- brazing
- normalizing

IMPAC - Specialist in non-contact thermometry

Technische Daten

Temperature ranges:	see reference numbers, other temperature ranges on request
Subrange:	any range adjustable within the temperature range, minimum span 51°C
Spectral ranges:	IS 140: 0.7 ... 1.1 µm IGA 140 1.45 ... 1.8 µm
Signal processing:	photoelectric current, digitized immediately
Accuracy: (ε = 1, t_{90} = 1 s, T_U = 23°C)	below 1500°C: 0.3% of measured value in °C + 1°C above 1500°C: 0.5% of measured value in °C
Repeatability:	0.1 % of measured value in °C + 1°C
Resolution:	interfaceand display: 0.1°C, analog output: < 0.1 % of temperature range
Response time t_{90}:	< 1 ms, adjustable up to 10 s („L" temperature ranges: with dynamical adaption at low signal levels)
Emissivity ε:	10 ... 100% adjustable in steps of 0.1%
Analog output:	linear 0 ... 20 mA or 4 ... 20 mA, DC, switchable; load max. 500 Ohm
Test current output:	fixed 10 mA (for 0 ... 20 mA analog output) or fixed 12 mA (for 4 ... 20 mA analog output)
Power supply:	24 V AC/DC (12 ... 30 V AC/DC) (AC: 48 ... 62 Hz)
Power consumption:	max. 2 VA
Sighting:	laser targeting light or thru-lens view finder
Serial interface:	switchable inside the pyrometer: RS232 or RS485 addressable, half duplex; baud rate up to 115 kBd
Parameters:	adjustable at the instrument or via serial interface: emissivity; response time; analog output; address; baud rate; waiting period t_W; °C or °F; setting of the maximum value storage; temperature sub range
Maximum value storage:	single or double storage; cleared by: - preselected time interval - external deletion contact or via digital interface - automatically with the next measuring object
Isolation:	power supply, digital interface, analog output are galvanically isolated against each other and housing
Protection class:	IP65 (nach DIN 40 050)
Ambient temperature:	0 ... 70°C at housing
Storage temperature:	-20 ... 80°C
Weight:	approx. 550 g
Dimensions [mm]:	195 x 56 x 62,5 (L x B x H)
CE-label:	according to EU directives about electromagnetic immunity

Advantages of the digital signal processing

The signal processing of series 140 pyrometers is fully digital, i.e. the detector signal are digitized immediately and digitally processed. With this technique an extremly high accuracy and repeatability as well as very long measuring ranges are achieved.

Accuracy:	The high accuracy will be achieved by the digital linearisation of the sensor output as well as the digital compensation of the ambient temperature.
Temperature range:	Due to the digital technique the user can set any temperature sub range within the full temperature range. The minimum span of the sub range is 51°C. The analog measuring output corresponds automatically to the selected sub range. This setting of a sub range can be done without recalibration of the pyrometer and does not effect the high accuracy and repeatability. As almost any sub range is adjustable, the storage of spare instruments or the replacement of other pyrometers is simplified.
Output:	The analog measuring outputs 0 ... 20 mA or 4 ... 20 mA are selectable as well as the serial digital interfaces RS232 or RS485. Additionally the interface allows the controlling of the pyrometer via PC.
Bus control:	The serial interface RS485 facillitates the integration of the pyrometer into existing field bus systems.
Calibration:	If a suitable calibration source is available, a calibration of the pyrometers can be done via serial interface without opening the housing.

Built-in LC-Display

Pyrometer with laser targeting light

Pyrometer with thru-lens view finder

Laser button

view finder

Optics

The series 140 pyrometers are available with 3 different focusable optics. They offer the smallest possible spot size at any distance. The adjustment can be done easily without additional tools with help of the „turn and clamp" mechanism (one hand). The spot sizes are shown in the following table (all distances are measured from the front of the lens).
The different optics are exchangeable without recalibration of the pyrometer.
For spot sizes between those in the table, values can be found by interpolation.

	Distance a	Spot size M
Optics 1:	130 mm	0.35 mm
(distance	160 mm	0.5 mm
130 ... 200 mm)	200 mm	0.7 mm
Optics 2:	190 mm	0.5 mm
(distance	300 mm	0.8 mm
190 ... 420 mm)	420 mm	1.3 mm
Optics 3:	340 mm	0.9 mm
(distance	2000 mm	6.5 mm
340 ... 4000 mm)	4000 mm	15 mm

Aperture D (depends on the objective distance):
Basic temperature range up to 1500°C: 14 ... 16 mm;
Basic temperature range above 1500°C: 8 ... 9 mm

Reference numbers

Pyrometers (basic instruments are equipped with laser targeting light):

3 875 100	IS 140	MB 14:	550 ... 1400°C		3 875 300	IGA 140	MB 13:	300 ... 1300°C
3 875 120	IS 140	MB 16:	600 ... 1600°C		3 875 320	IGA 140	MB 18:	350 ... 1800°C
3 875 140	IS 140	MB 18:	650 ... 1800°C		3 875 340	IGA 140	MB 25:	450 ... 2500°C
3 875 160	IS 140	MB 25:	750 ... 2500°C		3 875 360	IGA 140	MB 13.5 L:	250 ... 1350°C
3 875 180	IS 140	MB 33:	900 ... 3300°C		3 875 380	IGA 140	MB 20 L:	300 ... 2000°C
3 875 200	IS 140	MB 18 L:	550 ... 1800°C		3 875 400	IGA 140	MB 25 L:	350 ... 2500°C

Optional:
Thru-lens view finder instead of laser targeting light (*add* **010** to the basic instruments ref. number, e.g. 3 875 110 instead of 3 875 100)

Ordering note:
When ordering please select one focussable optics.
A connection cable is not included in scope of delivery and and has to be ordered separately.

Ordering example:
3 875 150   IS 140 with thru-lens view finder, focusable optics 2, temperature range 650 ... 1800°C
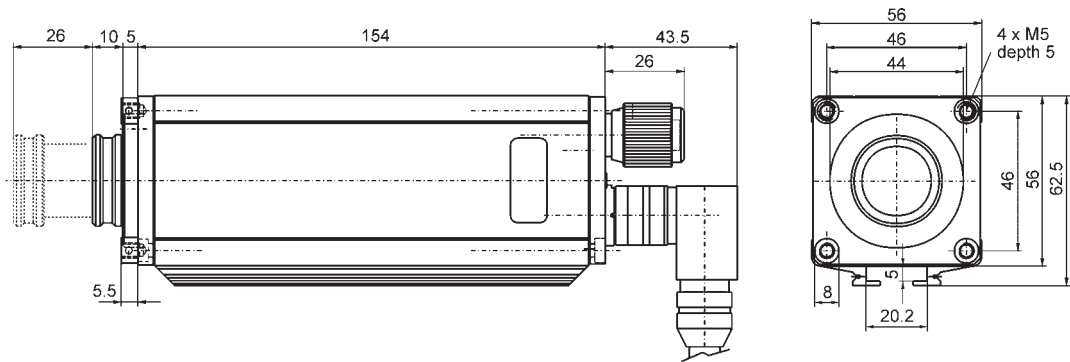3 820 530   connection cable, length 10 m, with 90° connector

Scope of delivery: Pyrometer with focusable optics, *InfraWin* operating and analizing software
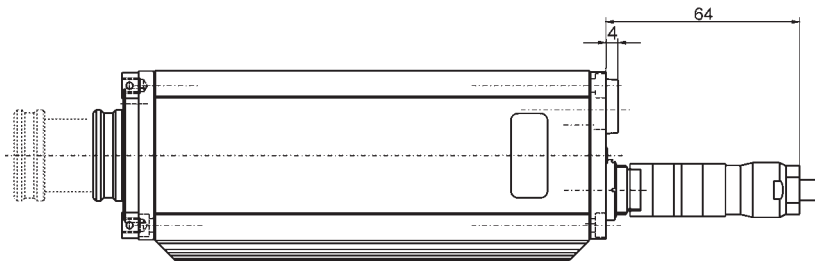
Accessories:
3 820 340	connection cable, length 5 m, 90° connector
3 820 530	connection cable, length 10 m, 90° connector
3 820 540	connection cable, length 15 m, 90° connector
3 820 830	connection cable, length 20 m, 90° connector
3 820 840	connection cable, length 25 m, 90° connector
3 820 550	connection cable, length 30 m, 90° connector
3 820 330	connection cable, length 5 m, straight connector
3 820 500	connection cable, length 10 m, straight connector
3 820 510	connection cable, length 15 m, straight connector
3 820 810	connection cable, length 20 m, straight connector
3 820 820	connection cable, length 25 m, straight connector
3 820 520	connection cable, length 30 m, straight connector
3 820 740	connection cable, length 5 m, straight connector, temperature resistant up to 200°C
3 820 750	connection cable, length 5 m, 90° connector, temperature resistant up to 200°C
3 834 280	adjustable mounting angle
3 834 270	ball and socket mounting
3 835 230	air purge
3 837 290	cooling jacket, stainless steel
3 835 060	air purge for cooling jacket

3 834 200	ball and socket mounting for cooling jacket
3 837 240	cooling plate
3 835 280	90° mirror
3 843 520	rugged scanner SCA 140, (scanning angle adjustable 0 ... 12°, scanning frequency adjustable 1 ... 5 Hz), with quarz glass window
3 835 290	air purge for scanner SCA 140
3 852 540	power supply NG 0D for DIN rail mounting; 85 ... 265 V AC $\Rightarrow$ 24 V DC, 600 mA
3 852 550	power supply NG 2D, as NG 0D: additionally with 2 limit switches
3 890 640	LED digital display DA 4000-N
3 890 650	LED digital display DA 4000: with 2 limit switches
3 890 560	LED digital display DA 6000-N: with possibility for pyrometer paramter settings for digital *INFRATHERM* pyrometers; RS232 interface
3 890 520	LED digital display DA 6000; DA 6000-N additional with 2 limit switches and analog input and output
3 890 660	IP 65 front cover for LED digital displays
3 826 500	HT 6000, portable battery driven indicator and instrument for pyrometer parameter setting

IMPAC 24 months Warranty

Dimensions

Pyrometer with
laser targeting light

56
46
44
4 x M5
depth 5
26
10.5
154
43.5
26
46
56
62.5
5.5
8
5
20.2

Pyrometer with
thru-lens view finder

64
4

All dimensions in mm

Overview accessories

Ball and socket
mounting

60
25
20
5
101
50
4.2
ø72

mounting angle

40
7
20
100°
50
5.2
5.2

36.8
6.4
6
8
34
40
60
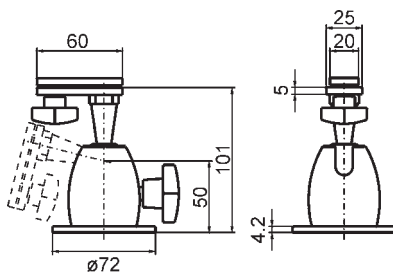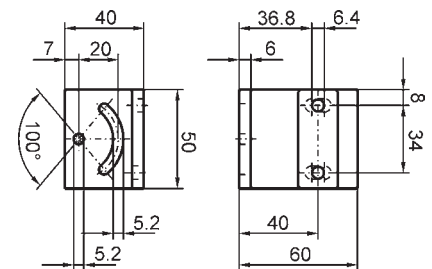
Cooling plate

90° mirror

air purge

Stainless steel
cooling jacket

Scanner SCA 140
for small angles up to 12°

1362.°C

LED digital display

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Temperature Measurement

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Specifications are subject to change without notice